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No. 9.

Bee-Culture in Cottage Hives.

No. 9.

EARLY SPRING TREATMENT.

At the approach of spring, as the weather gradually grows milder, bees speedily feel the change, become uneasy in their winter quarters, and prepare to avail themselves of the first opportunity to roam abroad. The first clear day, when the sun shines bright and warm, will tempt them forth; and the careful bee-keeper will exert himself to encourage and facilitate their egress. By placing small blocks under the edges of the hives, the warm air will the more freely enter, and the entire mass of bees be the more speedily roused.

It is oft-times important that the movement be rapid and general, that the workers may speedily discharge their faeces, as otherwise, by a sudden change of temperature, large numbers may be caught abroad and so chilled as to be unable to return to their homes. There need be no fear that by thus elevating the hives, robbers would be attracted, for when thus issuing for the first time in spring, bees have no disposition whatever to appropriate the stores of other colonies. They are so busily and intently engaged in their own appropriate duties, on the proper discharge of which they are instinctively conscious that much of their subsequent welfare depends, as not to be lightly induced to neglect them; and the greed for honey is at this time yet in a good degree dormant. At evening, after the masses have re-entered their hives and become settled, the blocks or wedges should be withdrawn again, the hives readjusted on the honey-boards, and all holes or openings, except the proper entrance, carefully closed, not only to prevent the escape of heat, but to preclude the ingress of prying marauders later in the spring. When practicable also, the opportunity may be used to change the bottom-boards of the hives, substituting clean and dry ones for those in use during winter.

When this cannot be done, the bottom-board may be cleansed by elevating the hive and gently scraping off the deposited debris and

filth by means of a paddle or spatula. This will save the bees a great deal of labor, and keep many from perishing. But a single supernumerary honey-board will enable the operator to accomplish his purpose by substituting it for that of one of the other hives, cleansing the latter, and using it to exchange for the next, and thus proceeding till the whole have been cleansed in course.

It is always more or less injurious if the bees issue when such mild weather occurs while the ground is covered with snow, especially if the sun shines when the bees come forth. Many are thereby blinded, drop into the snow, and perish. On such occasions it is advisable to scatter hay or straw on the snow in front of the hives, or to strew ashes upon it. If many bees thus get lost in the snow, they may be collected and put into a tumbler, which, after being covered with a piece of thin muslin or gauze, may be set in a warm room. Most of the bees will soon revive, and may then be given to one of the weaker stocks.

Should a spell of cold weather follow after the bees have been enabled to fly, they will cluster again in their hives, and ought then to remain undisturbed. The longer they can now be kept quiet, before the full opening of spring, the better. No bees are then lost, and as brooding proceeds gradually, an increase of population will be very perceptible when mild weather recurs.

While the bees are thus flying for the first time, the bee-keeper should carefully observe their deportment at every hive, to ascertain whether any are queenless. It is a favorable symptom when the bees come forth in masses, fly briskly, carry out their dead, and otherwise cleanse their hives, all seeming busily engaged in regular labor.

Inaction and sluggishness on the other hand are unfavorable symptoms, as are likewise a restless and discontented roving to and fro, as though in quest of something. Such stocks should be examined again late in the evening, and the bees have not yet become settled, they may be regarded as queenless, and will almost surely prove to be so.

If satisfied that a colony has a queen and is

populous, the only remaining question is as to the state of the stores. Bees managed in the manner directed in these essays, rarely need feeding in ordinary years, for prime swarms and the transposed parent stocks seldom fail to secure ample supplies for the winter. Spring feeding, to supply actual want, is hence never necessary in such an apiary.

But spring feeding may be resorted to for another and at times highly useful purpose—namely, to stimulate the bees to earlier and more energetic brooding. When thus employed by us, we usually divide the allotted quantity of honey—commonly three pounds—into six portions, giving them half a pound at each dose, and feeding these at such regular intervals that the last portion shall be administered just before full spring pasturage opens, thus preventing any interruption or cessation of the brooding process. Of course, we feed only those stocks which it is intended shall swarm, and which, consequently, alone need stimulating.

For food nothing besides pure honey or sugar candy should be used. Which of these is to be preferred depends on the season. If this be already much advanced—say the end of March or the first of April, use diluted honey, or two parts honey mixed with one part water; or take one part honey, one part sugar candy, and one part water. Earlier feeding for stimulating purposes is objectionable, and should never be resorted to, and where from some unusual cause winter feeding appears to be necessary, undiluted honey should alone be used, or sealed honey in the comb when it can be made accessible to the bees through an opening in the top of the hive. We prefer, however, in every case to unite a colony that appears to require feeding in the winter with some other stock well supplied with stores.

Experience has taught us that winter feeding, if the colony is feeble, is not only troublesome and expensive, but rarely of any real use, because, if such do not at last perish in the spring, it will require continual nursing during the ensuing summer, and prove to be a source of vexation instead of pleasure.

Stimulative feeding as early as in February or the beginning of March is almost invariably injurious, as the bees are thereby tempted to fly out, even in cold days; become chilled, and perish; or if the rigor of the weather is still such as to keep them confined, they are likely to suffer from dysentery.

From about the middle of March onward, bees should also be fed with rye-meal or wheat-flour whenever the weather permits them to fly. It may be put in a shallow box or in the cells of one side of old drone combs, and set in some sheltered nook near the apiary, to which the bees may be attracted by previously placing there, for their use, a plate containing a small quantity of diluted honey. They will carry in flour or meal freely, so long as they cannot gather pollen, for which it is found to be an excellent substitute; but they will totally neglect it as soon as they can procure pollen from natural sources.

This whole matter of spring feeding, however, except for the stimulative purposes already

mentioned, should be regarded by the bee-keeper as an annoyance to be guarded against. He should be careful not to winter any stocks not supplied with sufficient stores to carry them safely through the longest and hardest winter. Better, far better, to unite his weak colonies early in the fall, and feed them plentifully while they can yet cap the honey in the cells. He will thereby save himself much uneasiness in the winter, and vexation in the spring. His stocks will be in a condition to begin brooding as early as it is desirable or safe for them to do so; early swarms may then be expected; or his bees will at least be in a condition to avail themselves of the pasturage which the country around may supply, when the season fairly opens.

We have made no reference to any of the numerous substitutes for honey which have been proposed, recommended, or used as bee-feed. We have never resorted to any of these ourselves, and have not found that those who did so derived any permanent benefit therefrom. They cannot safely be used, except at times when the weather permits the bees to fly, and are thus unfitted for winter or early spring feeding; and they are of no account whatever when the season is so far advanced as to allow bees to roam abroad. Besides, were they not otherwise objectionable, it would be found, from the cost of the articles and the trouble of preparing and administering them, that there is no saving in the end. Hence, if feeding must at any time be resorted to, it will be cheaper, more convenient, and certainly far more safe, as being conducive to the health of the bees, to procure honey for their use.

But even this, if it cannot be given them in the comb, should be boiled, skimmed, strained, and diluted by the addition of one-third the quantity of pure water, before it is used as feed. Much of the honey imported from Cuba is impure, or at least from some cause noxious to bees; and the introduction of foulbrood in apiaries, where it was used, has been in repeated instances attributed to it. Copper and brass vessels, too, have been said to impart poisonous properties to honey kept in them; and German silver has recently been added to the catalogue of suspected articles. Whether these are really contaminating or not, has not yet been clearly ascertained; but prudence will admonish the cautious bee-keeper not to let his bees have access to honey kept in such vessels.

SOME critics have found fault with the poet Southey, for ascribing, in his "*Curse of Kehama*," to Camdeo, the Cupid of Indian mythology, a bow strung with bees. The idea is not so absurd as they imagine; and the poet doubtless was led to it by his knowledge of the natural history of these creatures, and that they form themselves into strings, festoons, or chaplets.

ANGER is no useless passion in bees. It is necessary to them for the preservation of themselves and their property, which, besides those of their own species, are exposed to the ravages of numerous enemies.

[From the (London) Journal of Horticulture.]

The Egyptian Bee.

PART VI.

HOW I PROPAGATED IT, TESTED IT, AND FINALLY GOT RID OF IT.

Without entering into particulars, which may, however, be ascertained by referring to No. XXVI. of "Bee-keeping in Devon," which appeared in No. 241 of "our Journal," I may briefly state, that during the latter end of August and the first week of September, seven more young Egyptian queens were hatched out, whereof six were fecundated in due course, whilst one fell a victim to a regicidal attack made upon her by her worker sisters. It is a remarkable fact that whatever might have been the case with the first queen, the whole of the last six were unquestionably fertilized by small Italian drones bred in worker cells, the last few full-sized drones that I possessed having been destroyed about the middle of September.

The remainder of the autumn was devoted to strengthening the Egyptian element in my apiary, which now consisted of the first stock, with the original queen, and seven young colonies, all the produce of the solitary queen which, having been received so late as the 30th of July, alone survived the massacre of her attendants, and was placed at the head of a small nucleus on her arrival.

The spring of 1866 was, of course, looked forward to with great interest, and found me in the possession of eight fine Egyptian colonies, which had passed the ordeal of an English winter perfectly unscathed. In point of fact the original Egyptian queen (owing, doubtless, to the extra care and pains bestowed upon her) was at the head of by far the strongest colony in my apiary, whilst the seven others would compare advantageously with any seven of my Italian stocks that could be selected, and I looked forward with much delight to the accomplishment of the pleasing task of propagating what I at that time believed would turn out to be a race of bees superior even to the Italians in docility and beauty. But here occurred a mischance which in its results gave me the first hint as to the true character and disposition of my African *protégées*.

Whilst examining one of the young colonies on the 20th of April, I noticed what appeared something like a small regicidal cluster at the bottom of one of the combs. Seeing the queen, however, almost the next instant run across the same comb at perfect liberty, I deemed myself mistaken, closed the hive in all haste, and thought no more of the matter. The result proved that I had treated this occurrence too lightly, for next morning the poor-deposed sovereign lay dead in front of the hive. As, however, she happened to be very fresh and retained her beauty in a remarkable degree, a clever entomological friend succeeded in stuffing and setting her up most admirably, and she now figures in the British Museum as the only specimen in that vast collection of a queen-bee of *Apis fasciata*. But this is by the way.

Egyptian drones having by this time made their appearance, I did not attach much importance to the loss of what was at best but a hybridized queen, and accordingly set to work to exchange brood-combs with the original stock, so that the whilom regicides might be compelled to raise a pure queen.

But this was no easy task; the little rascals showed fight with all the fiery impetuosity of a body of Prince Rupert's cavaliers, combined with a stern determination and indomitable resolution which would have done credit to a corps of Cromwell's redoubted Ironsides. Quickly was I compelled to put on India-rubber bee-gloves, (a piece of armor which I had long disused,) and soon afterwards discovered that, whilst wearing slippers, I labored under the same disadvantage as Achilles, in being vulnerable at the heel. Nor was this all. When the exchange had been effected, the hive restored to its normal state, and, as I thought, a truce proclaimed, these indomitable little Amazons would have none of it, but attacked and stung all and sundry that ventured into the garden, until I became convinced that it was in vain to indulge further a hope for peace, and was ultimately compelled to banish them to a secluded position a mile and a half distant, where they remained until the evening of the 7th of May. On examining them the next morning, I found that two royal cells had arrived at perfection, whilst all the rest were destroyed; and a stricter scrutiny revealing the fact that the two recent denizens of the naturally-opened queen-cells had not yet met in mortal combat, but were still surviving within the hive, its inhabitants were forthwith divided into two colonies, with a young queen at the head of each. The remarkable display of spirit on the part of my recent acquisition caused me to pause in the attempt to propagate *Apis fasciata*, but it required much more than this to force me to the course which I was afterwards compelled to adopt.

Any one who turns back to No. 241 of "our Journal," to which I have before referred, will see that the fifth Egyptian queen developed some extraordinary phenomena, which I there described as follows:

"When she was about ten days old, I noticed a single egg in a worker cell which appeared to be the signal for the destruction of a few full-sized drones which existed in the hive at the time. More eggs were gradually deposited in the adjoining cells, and all receiving the raised convex coverings appropriate to drones, whilst the abdomen of the queen (a very small one) remained undistended, I doubted not that she would turn out a confirmed drone-breeder. When rather over twenty days old, I noticed, much to my astonishment, a remarkable change in her appearance, which suddenly assumed the graceful degree of *embonpoint* proper to an impregnated queen. This was accompanied by an equally notable change in the manner of her oviposition, which from being sparse and unequal became copious and regular. Soon afterwards it also became evident that her progeny would not be entirely of the male sex, a few cells of worker brood appearing here and there

amidst the protruding cradles of the drones; and this proportion has gradually and steadily increased until I have every reason to believe she has assumed the status of a fully-developed queen, breeding workers only as is proper at this season."

It is not a little singular that after breeding workers only, as is usual during the early spring, she, as summer approached, reverted to the condition of a drone-breeder, depositing male eggs only in the worker cells, until I ultimately decided on removing her, and sent her to my friend, Mr. F. Smith, of the British Museum, to be by him killed and set up as an entomological specimen.

In the mean time, as I had ceased the propagation of the Egyptian variety, that element in my apiary became somewhat diminished. One stock, transferred to the Acclimatization Society, took its departure for the gardens of the Royal Horticultural Society at South Kensington, where it has done well, and has partially filled a super with the first honey taken in England from Egyptian bees. The queen and bees of another stock went to Leeds, there, I hope, in some measure to compensate Mr. F. H. West for a stock of Italians, which became very much weakened during its transit from my apiary to the north. What it has done, and how it has succeeded, we may probably learn from him in due course. The original stock was sent to Mr. Lowe, of Edinburgh, who will, I hope, relate the result himself.

Having, therefore, materially reduced my stock, the unwelcome conviction slowly but surely forced itself upon me that Egyptian bees were wholly unsuited for experimental purposes when kept in a garden adjoining a public and well-frequented thoroughfare. So long as they were not meddled with they were peaceable enough, but let but a crown-board be removed, and every bee that could fly was instantly on the wing to resent the invasion, leaving the hive and combs in the occupation only of the queen and such juveniles as had never taken wing. How they searched out and penetrated every weak point in the bee-armor; how they crept up under the sleeves and crawled up the trowsers, it boots not here to relate; suffice it to say that if they had confined their attentions to the actual aggressor all might have been forgiven, but such unfortunately was not the case. The slightest operation upon an Egyptian stock became the signal for a most appalling outcry out of doors. Helpless infants in perambulators were stung nearly into fits; lagging errand boys were startled from their usual loitering gait, and sent blubbering to their destination at a pace which must have highly gratified their employers; wretched little lap-dogs with whizzing yellowish-white pellets viciously embedded in their well-washed coats ran yelping piteously for protection underneath the petticoats of their horrified and distracted mistresses; most potent, grave, and reverend seignors sprang headlong into the arms of affrighted serving-maidens, each rushing in opposite directions to escape the unforeseen attack; whilst, to crown the whole, a large school of young ladies was not only frightened from

its propriety, but put to the most utter and ignominious rout. It says much for the forbearance of the Exonians that no formal complaint was made either to or of me; but I could not but be aware of what was going on, and came to the conclusion that the remaining Egyptians must be got rid of. After transforming some by an exchange of queens, I had yet five remaining, which I disposed of in the following manner: three were exchanged for common stocks with my friend Mr. S. Bevan Fox; one I presented to Mr. George Fox, of Kingsbridge, and the last, which was a nucleus without a queen, I fairly stifled and buried, thanking Heaven as I trod in the earth over their grave, that I was at length happily quit of the Egyptian Bee.—A DEVONSHIRE BEE-KEEPER.

On the evening of the 6th of June the stock of Egyptian bees most kindly presented me by my friend, Mr. Woodbury, arrived safely. These bees comprised the entire tenants of one of his frame hives, and had been transferred by driving to a flat-topped straw-hive for facility of transit. Although they had just experienced a coach journey of ten miles or so over rough roads, with the customary bustle at the inn-door, and not over-careful porters, yet when delivered into my hands nothing could be quieter or more satisfactory than their condition. As it was late when I received them, I thought it better not to transfer them to their future tenement until the following day. I therefore placed them upon their stand, after removing the net which had so amply provided them with air, but effectually confined them during their journey, at first taking a peep into the hive, which revealed, to my exceeding delight and satisfaction, a cluster of the beautiful little fellows occupying fully two-thirds of the space. There were no manifestations of resentment upon the removal of the wrappers, not a bee having left the cluster; in fact, I was struck by their quiet behavior under the circumstances; but the previous summary proceeding in expelling them from their own hive may, however, have subdued them for the time.

On the evening of the 7th a nine-frame box prepared with strips of impressed wax-sheets of home manufacture was ready for the bees, and with great facility they were transferred to their new abode, settling in it so quietly and quickly that I was enabled soon to close up, cover, and lower down the hive, and place them upon their stand. I was surprised at the number and great beauty of the drones, their superiority in the latter respect over the Italians being very manifest. They worked well through June, quickly filling their hive with comb and honey, increased in numbers until densely crowded, gave me also a few pounds of honey in a glass super, and now, in the middle of November, are far more populous than any black stocks in my possession. I am inclined, therefore, from this satisfactory state of affairs to think that their queen is a most prolific creature, and I look forward to and expect notable doings next summer from them.

And how about their extreme irascibility? I

must tell my tale, as well as those other fortunate possessors of *Apis fasciata*—but how different my experience! I have manipulated them as freely as upon any other hives; neither myself nor any of my friends have yet experienced any manifestations of their anger. This is so adverse to the accounts given by others, that some extenuating cause must be found to account for it. In the first place, I am singularly fortunate amongst my bees, my constant presence may have rendered them peaceable and tame, and coolness and quiet in my operations amongst them have their influence in subduing anger.

Surely there must be something wrong when our friend, Mr. Woodbury, so used as he is to the repeated examination of his hives, should have been so troubled by them. Just now, whilst jotting down these remarks, I have tried their temper by stepping into my garden and removing the crown-board of their hive, passing my hands over the frames amidst a dense mass of bees covering the bars. I experienced no inconvenience from this operation. Whether it may be different by-and-by I do not know; but at present, and since I have been the possessor of this stock of Egyptians, I cannot endorse the character given them of extreme irascibility and impatience of manipulation.—
GEORGE FOX, *Kingsbridge*.

For the American Bee Journal and Gazette.

Questions for Consideration.

No. 1.

Will it pay to cultivate any plant expressly for honey? If so, which plant is best? How many acres would keep one hundred colonies busy while in bloom? How many days in average seasons, and how long each day, does it yield honey? What soils are best adapted to its growth? Is it an annual or a perennial?

No. 2.

How can specimens of dead bees be preserved without losing color or shape?

No. 3.

What is the cause of honey creating colic in some persons, and not in others?

No. 4.

What is artificial honey-comb made of, and does it work well?

No. 5.

How large a quantity of sugar or feed could be fed to one stock of bees and their artificial increase from the first of April until the last of September, or in six months?

No. 6.

Can a stock of bees troubled with dysentery void their excrements in a wire basket attached to the hive, and the hive placed in a warm room? And will the bees return to the hive?

M.

For the American Bee Journal.

The Egyptian Bee—*Apis Fasciata*.

Mr. Editor: Having been the first to import this variety into the New World, I desire through your columns to answer some of the numerous inquiries addressed to me respecting them.

As these bees were received late last fall, the most that I can say of them from experience is that the workers excel in beauty the Italians, having rich yellow, black, and whitish bands.

The first mention that I find made of the *Apis Fasciata* is in 1804 by the celebrated French naturalist Latreille, ("Ann. Du Museum Hist. Nat. Tom. V.") who gives the following description of the worker: "Blackish brown, the down on the top of the head; the corselet and the base of the abdomen, yellowish grey, the shield, the first two rings of the abdomen and the base of the third, reddish; the third and following rings of an ashy grey; the posterior border of all of them of a deep brown."

In those I have examined, the first three rings are of a reddish or rich orange color, and the base of the fourth. A single drone which survived the journey was very beautifully colored. The queens have the last two rings of the abdomen dark-brown or black, and the others a rich orange, bordered with dark-brown or black bands. Latreille gives the measurement of the Egyptian worker as 11 French millimetres, and that of the black worker as 12, showing the Egyptian to be considerably smaller than our common bee.

Herr Vogel is of opinion that the Italian bee is a hybrid from the black and the Egyptian bee. When we consider how extensive was the intercourse between Greece and Egypt in the time of Herodotus, nothing seems more likely than that the Egyptian variety was introduced into Europe, thousands of years ago. Spinola, who first described scientifically in 1808 the Italian bee, giving it the name of *Apis Ligustica*, says: "Aristotle and all the later ancient writers agree in describing the variegated or colored bee as of a smaller size." Now, as it is well known that the Italian bee is not smaller than the black bee, it would appear that those writers were describing, not the Italian, but the Egyptian species.

As *Apis Fasciata* is evidently a fixed or stereotype race, it will probably be much easier to keep it pure than the Italian variety; and if it should in other respects prove equal to the Italian, it will, of course, have the preference among our bee-keepers.

Having furnished to the BEE JOURNAL, the London Journal of Horticulture, which gives such an unfavorable account of the temper of the Egyptians, I shall venture the assertion that Mr. Woodbury's experience in the moist and cool climate of England, the exact opposite to that of Egypt, can hardly be accepted as a proof of the bad temper of the "children of the Nile." All Mr. Woodbury's stocks also, with one exception, had hybrid queens, and our experience with hybrid Italians has been such as to prepare

us for almost any amount of ferocity from such mixtures. None of us who have handled even the pure Italians in such damp and cool days as usually prevail in England, can have failed to notice that they are far less peaceable than, than when operated upon in our hottest weather.

The following is Vogel's account of the temper of the Egyptians as given in a letter to Mr. Woodbury:

"You were kind enough to inform me that the Egyptian bees were very much inclined to sting. This my experience confirms. The Egyptian bees cannot bear tobacco-smoke; if used during an operation they get very angry. They do not in Egypt employ tobacco-smoke, but use that of dried cow-dung. Mr. Soliman, an Arabian, who has a hundred hives, always employs the latter when performing an operation. I use the smoke of decayed wood, but this does not prevent their attacking me. You are perfectly right in saying that the Egyptian bees are very easily irritated, whilst on the other hand they are very good-natured, and if people study their temper, they are very easily to be managed."

Vogel's opinion agrees with that of Columella, who nearly two thousand years ago, in describing the smaller variety as more peaceable than the larger kinds, says the anger of the better variety of bees is easily assuaged by the frequent presence of those who have the charge of them, for the oftener they are handled, the sooner they become gentle.

It would have been highly gratifying to the many admirers in this country of the celebrated Dzierzon, to have had him give us his experience with the Egyptian bees. The following, however, from a communication of his to the *Bienenzeitung*, will show that he has determined not to introduce it into his apiary:

"I have received so many letters from persons who imagine that I have already obtained the Egyptian bees, that, in order to prevent similar inquiries, I wish to state that interesting as are the observations which Herr Vogel has already made with regard to this bee, I have taken no steps whatever to establish it in my apiary, inasmuch as one cannot keep two races perfectly pure in the same place; but I am so firmly convinced that the Italian bee is the queen of all races; that she is the *ne plus ultra* in beauty, good nature, industry, and ability to defend herself; that, for this reason, I would exchange her for no other. That she may be maintained thriving and pure in our climate is manifested by thirteen years experience, during which she has been improved by careful breeding. This was proved at the last exhibition at Brunn, where, of the four queens brought from Italy, none were equal in beauty to the one found in the hive exhibited by me."

It may well be that the Italian bee is the "*ne plus ultra*" of the honied tribe, but we shall be all the better prepared to yield it the palm, when we have from actual trial of the other kind proved its superiority. Our American apiarians, gratefully acknowledging their indebtedness to Dzierzon for the introduction into Germany, and wide dissemination of the

Italian race, and to Vogel for giving us the opportunity of experimenting with the Egyptian bee, are, as we happen to know, even now preparing to introduce into this country all the leading varieties of honey-bees known to exist in Europe, Asia, or Africa; satisfied that only after we have given to all a fair trial, can we safely say which is the best.

I cannot close this communication without paying a deserved tribute to Mr. Woodbury for the admirable manner in which he prepared a colony of bees with an Egyptian queen expressly imported by him for me from Vogel's apiary. Although the bees had been detained nearly a week in the Custom-house at New York, I found, on opening the hive at Brooklyn, that they had suffered little, if at all, from their long confinement, few more if any having died than would have perished had they remained on their stand in his apiary. The arrangements for giving the bees air were excellent, and the devices for preventing the combs from being broken, were superior to any I have ever seen.

L. L. LANGSTROTH.

OXFORD, BUTLER Co., OHIO, Jan. 10, 1867.

For the American Bee Journal.

Bees Building in a Room.

In the fall of 1865, a gentleman in Amherst C. H., Va., having lost a great many of his hives by theft, determined to secure the remaining ones by putting them in a room, in a vacant house on his premises.

Last season being uncommonly favorable in that section, his bees soon filled their hives, and began to build between them and the wall, some of the stronger swarms extending their combs nearly to the ceiling, and all of them storing great quantities of honey. During the summer of course no one could enter the room, for it resembled a mammoth bee-hive. But when the cold weather set in, the bees all returned to their hives, and the honey was removed with care.

I am anxious to know how the bees will do next summer, for in all cases I have before heard of, attempts to induce bees to build in rooms have been failures.

The success in this case may have been owing to the very favorable season, and I would not advise any one to try the experiment on account of it. W.

ELKIDGE, MD., Feb. 5th, 1867.

HONEY is best clarified by means of a hot-water bath. This may be readily improved by putting the jar containing it in a saucepan or boiler of water, which should be placed on the fire, and boiled until the honey becomes perfectly clear, all impurities being removed by skimming as they arise. Store it in air-tight jars, and keep it in a cool place.—*London Journal of Horticulture.*

Inmates of the Hive.

As every reader is not aware of the differences of form that distinguish the queen, drones, and workers from each other, a technical description is here given of those pertaining to the common black or brown race.

The body of the female bee or queen is considerably larger than that of either the drone or the worker. The prevailing color in all three is the same, black or black-brown; but with respect to the female this does not appear to be invariably the case. Reaumur affirms, after describing some differences of color in different individuals of this sex, that a queen may always be distinguished from the workers and males by the color of her body. If this observation be restricted to the color of some parts of her body, it is correct; but it will not apply to all generally, unless by the term body, he means the abdomen. In all that I have had an opportunity to examine, the prevailing color, as I have stated it, is the same.

The head is not larger than that of the workers; but the tongue is shorter and more slender, with straighter maxilla. The mandibles are forficulate, and do not jut out like theirs into a prominent angle. They are of the color of pitch with a red tinge, and terminate in two teeth, the exterior being acute, and the interior blunt or truncated. The labrum or upper-lip is fulvous, and the antennae are piceous.

In the trunk the tegulae or scales that defend the base of the wings are rufo-piceous. The wings reach only to the tip of the third abdominal segment. The tarsi and the apex of the tibiae are rufo-fulvous. The posterior tibiae are plane above, and covered with short adpressed hairs, having neither the corbicula (or marginal fringe of hairs for carrying the masses of pollen) nor the pecten; and the posterior plantae have neither the brush formed of hairs set in striæ, nor the auricle at the base.

The abdomen is considerably longer than the head and trunk taken together, receding from the trunk, elongato-conical, and rather sharp at the anus. The dorsal segments are fulvous at the tip, covered with very short, pallid, and in certain lengths, shining, adpressed hairs; the first segment being very short, and covered with longer hairs. The ventral segments, except the anal, which is black, are fulvescent or rufo-fulvous, and covered with soft longer hairs. The vagina of the spicula (commonly called the sting) is curved.

The male bee or drone is quite the reverse of his royal paramour; his body being thick, short, and clumsy, and very obtuse at each extremity. It is covered also, as to the head and trunk, with dense hairs.

The head is depressed and orbicular. The tongue is shorter and more slender than that of the female, and the mandibles, though nearly of the same shape, are smaller. The eyes are very large, meeting at the back part of the head. In the space between them are placed the antennae and stemmata. The former consist of fourteen joints, including the radicle, the fourth and fifth being very short and not easily distinguished.

The trunk is large. The wings are longer than the body. The legs are short and slender. The posterior tibiae are long, club-shaped, and covered with inconspicuous hairs. The posterior plantae are furnished underneath with thickset scopulae, which they use to brush their bodies.

The claw-joints are fulvescent.

The abdomen is cordate, very short, being scarcely so long as the head and trunk together, consisting of seven segments, which are fulvous at their apex. The first segment is longer than any of the succeeding ones, and covered above with rather long hairs. The second and third dorsal segments are apparently naked; but under a triple lens, in a certain light, some adpressed hairs may be perceived—the remaining ones are hairy, the three last being inflexed. The ventral segments are very narrow, hairy, and fulvous.

The body of the workers is oblong.

The head is triangular. The mandibles are prominent, so as to terminate the head in an angle, toothless, and forficulate. The tongue and maxilla are long and incurved; the labrum and antennae are black.

In the trunk the tegulae are black. The wings extend only to the apex of the fourth segment of the abdomen. The legs are all black, with the digits only rather piceous. The posterior tibiae are naked above, exteriorly longitudinally concave, and interiorly longitudinally convex; furnished with lateral and recumbent hairs to form the corbicula, and armed at the end with the pecten. The upper surface of the posterior plantae resembles that of tibiae; underneath they are furnished with a scopula or brush of stiff hairs set in rows. At the base they are armed with stiff bristles, and exteriorly with an acute appendage, or auricle.

The abdomen is a little longer than the head and trunk together, oblong, and rather heart-shaped—a transverse section of it is triangular. It is covered with longish flavo-pallid hairs; the first segment is short with longer hairs; the base of the three intermediate segments is covered, and, as it were, banded with pale hairs. The apex of the three intermediate ventral segments is rather fulvescent, and their base is distinguished on each side by a trapeziform wax-pocket covered by a thin membrane. The sting, or rather vagina, of the spicula, is straight.

The society of a hive of bees, besides the young brood, consists of one female or queen, several hundreds of males or drones, and many thousand workers.

Long before Linnæus had discovered the necessity of the flowers, those industrious creatures, the bees, had made themselves acquainted and intimate with every form and variety of them; and no botanist, even in this enlightened era of botanical science, can compare with a bee in this respect. The situation of these reservoirs, even where the armed sight of science cannot discover it, is in a moment detected by the microscopic eye of this little creature.

For the American Bee Journal and Gazette.

Unanimosity of Bees, as Effected by Experimental Science.

Mr. Editor: With feelings of unavoidable diffidence, mingled with a good share of trepidation, I solicit of you the favor to allot to me, occasionally, a column or so in your Journal, that I may lay before your readers my many experiences, philosophic experimentations, as well as practical manipulations in apiculture. I am only a few years old bee-keeper, hence my diffidence, of an unabateable philosophic turn of mind, and, therefore, my trepidation in anticipation that my communications may, at times, collide with the views of those of maturer years who have copied after the blind Geneva philosopher, and others less entitled to perfect vision. Yet, though my articles may not always meet with general approbation from this class of observers, whose crude, metamorphosed aboriginalities I shall avoid as much as possible, they may, on account of this very novelty of treating the subject, possibly be the means of evolving one or more fact or facts before unknown, and thus save, perchance, many a sting and half a dollar to my younger and more inexperienced bee-friends. For these reasons, therefore, Mr. Editor, I propose to exhaust the subject under consideration without an apology.

The three experimental swarms of bees which were obtained in such a novel manner from my old-fashioned bee-keeping neighbors, as stated in the February number, page 147, of your Journal, were placed, after they had been brought to their standard weight with sorgho molasses, at some distance from all others, on isolated stands in the cellar—entrance open, with half honey-board removed. Here they stood till the 16th day of January, when late in the night I discovered that the occupants of one of these stocks were very boisterous inside the hive. I procured a light, and found, to my surprise, that hundreds of bees were perambulating the entrance-end, while a great number of them continually entered and reissued in precipitation. I also found that moisture was oozing out from between the hive and the bottom-board. Immediately I took off the cap, and what do you think was the matter? Why—I had forgotten, in this instance, to remove the honey-board, the holes of which were covered with pieces of glass hermetically sealed thereto. On removing the board, a steam quite visible ascended from the combs, emitting at the same time a mingled perfume of *Allspice*, not in the least gratifying to a refined sense of smell. On examining the combs, it was found that those on the outside, the honey of which being capped over, were in good condition on top, but mouldy at their lower extremities. The middle combs, the contents of three of which being mostly uncovered, presented themselves to my view as if they had been dipped in brewers' yeast, and were, of course, the cause of the unpleasant odor. I now replaced the frames, leaving this time the cover and the honey-boards off for the night, and retired.

Early in the morning of the 17th I proceeded to the cellar and removed the hive in question to an up-stairs room, brought an empty hive, two wash-tubs, and filled one of them with clean water, kindled a fire in the grate, spread a wollen blanket on the carpet, an old bed sheet thereon, the empty hive in the midst thereof, the outside frames of the mephytic hive in the middle herein, the central, froth-covered combs round about it, and left with a heavy heart to attend to a more cleanly stock.

Now, thought I, during my absence from them my bees will be sure to enter the new hive, and cluster among the comparatively clean combs, and thus will be out of my way when I shall attempt to cleanse the filthy ones. But judge of my consternation when, after an hour of absence, on re-entering the room, I found the fire brightly blazing in the grate, and the bees a-humming and a-buzzing around and above me, thousands of them endeavoring to escape through the window panes, other thousands crawling over the costly tapestry, the clean, white bed-clothes and the French plate, gilt-framed mirror! Horror of horrors! What a buzz, and what a fuss, and what a mess they made! They did not attempt to sting, for they well knew I expected a bottle of Prof. Flander's Bee-Charin, per mail, that day. My! My! What's to be done!

The bees, to be sure, were out of my way, but look at the walls, and the mirror, and the bed, and * * * Just at this moment a sprightly, little, alternate bee popped its head from the China-urn beneath, when I was struck *instantly* with the idea that this must be what our old-fashioned bee-doctors call "Dis-endairy," and the more thought and study I bestowed upon the matter, the more sure am I that it was a disease nearly akin to the above, and which I will commemorate in apistical literature by the more modern and appropriate name of *kakejery*. But to return to our unclean combs.

I took each of them *individually*, holding it with one hand over the empty wash-tub and pouring one dipper full of water after another over it, till it was free from the protruding, yeast-like froth, and when all were made as clean as could be well expected, I immersed each one separately into the clean water remaining, gave it a good shaking over the other tub, and placed them again around the hive from which the bees had previously absconded, and thus allowed them in a measure to dry. After cleaning the old hive of dead bees and other impurities, I returned all the frames into it, and it thus was ready for the reception of the bees; but,

"A Bee or not a Bee, that was the question;"

and not till I thought of the *empty bottle* of "Prof. Flander's Voluble Extracts (see note) of the Quince, A. Nise, Funny Greek, and other vegetable productions," (Home, Sweet Home, and other songs,) page 14, could they be induced to stir from the walls and the windows.

These cunning little insects, as soon as they

became aware of what I was after, formed into a cluster on the ceiling, directly over the hive, and, on showing to them the flandrin bottle, they, *Presto!* as if touched by a magician's wand, "*unanimously*" dropped from the ceiling among the frames, when, in a jiffy, I clapped on the cover, placing the bottle on top as a sentinel to keep them in.

And here I propose to leave them till your readers shall feel interested in what became of them thereafter.

Most delightfully, yours, &c.,

Prof. A. P. ASTER ALSATIUS A. M.,

Ph. D. Asst. Experimental Philosopher in Entomological Metempsychosis, Molecular Micromimics, and Corresponding Secretary of Coon Island Golden Apiary, West End, Pa., 12½ miles from shore.

NOTE.—Professor Flander says "*Taint*," I know better; I say *It is*, for by a certain alexiterial subjection of these *Extracts* to my *Astral-omeliphagostic Pantalembickosmatrabilarium, I have obtained a substance in every respect identical with the thrasico-trigonellano-hegemicrocosmological fluidity of Prof. Flanders.†

The additional powers inspissated by the above laborious process to this already wonderful "*Charm*," have induced me to apply, by-and-by, (Oh my!) for letters patent wherewith to protect the bottles before sending them, per mail, to my customers.

Mr. Editor, if you will send me three stamps, I will forward to you a quart of it for trial next season. It does not smell very bad, and I think it is very good.

* P. S.—For the benefit of those of your readers who do not, like we Professors, understand the meaning of the above chemical expressions, I would say that the first is the machine newly invented and patented, by the use of which we can extract the volatile oil of "*Funny Greek*."

† The second is, the oil obtained so "*fixed*" that the "*Funny Greek*" cannot evaporate.

THE larvæ of bees, though without feet, are not without motion. They advance from their first station at the bottom of the cell in a spiral direction. This movement, for the first three days, is so slow as to be scarcely perceptible; but after this it is more easily discerned. The insect now makes two entire revolutions in about an hour and three quarters; and when the period of its metamorphosis arrives, it is scarcely more than two lines from the mouth of the cell. Its attitude, which is always the same till its metamorphosis approaches, is a strong curve. This causes the inmate of a horizontal cell to be always perpendicular to the horizon; and that of a vertical one to be parallel with it.

BEEs are generally thought to foresee the state of the weather; but they are not always right in their prognostics. Reaumur witnessed a swarm, which, after leaving the hive at half-past one o'clock, was overtaken by a heavy shower at three.

[From the American Agriculturist.]

Impurities of Cross-bred Drones.

BY BIDWELL BROS., ST. PAUL, MINN.

The best apiarists, both in this country and Europe, consider that a pure Italian queen, in mating with a less pure or black drone, though producing cross-bred queens and workers, will nevertheless produce pure Italian drones. In our experience we have not found it so.

The great multiplication of Italian bees in Europe as well as America, is by what is termed Italianizing—that is, removing a black queen and substituting an Italian in her place. Her progeny in time replace the black bees. Queens for the remaining hives of the apiary are reared by removing the Italian queen and compelling the queenless bees to rear one or more "*forced queens*" from her worker eggs or larvæ. After hatching, these fly out to meet the drones, which at that time are for the greater part black drones, the progeny of the previous black queens, or belonging to neighboring hives. The drones of these "*hybrid queens*," so-called—(Italian queens which mate black drones,) are claimed to be pure Italians, and are allowed the second season to mate with queens subsequently reared from eggs of the original pure queen, thereby affecting, we claim, in a degree, the greater part of the apiary.

In bee-breeding these facts are established, viz: Queens that have never met the drones will lay fertile eggs which will all hatch into drones. Queens never meet the male but once, and after this they are called "*fecundated queens*." Their eggs are directly influenced by the fecundative principle, or not, at volition. These eggs which are thus fecundated produce workers or queens; those which are not fecundated, as is the case with the eggs of the non-fecundated queens, produce drones. From these premises, and from the fact that an Italian queen crossed with a black drone produces drones more or less closely resembling pure Italians, apiarists argue that the drone progeny must be of the original purity of the virgin queen, and advise the use of such drones in apiaries.

Now we claim that a pure Italian queen, in mating with a less pure drone, or with a black drone, is tainted, and remains a cross-bred ever after. Certain it is that the seed of the drone forms a part of her system, requiring the blood or fluids of her body to circulate into it and back into her for its nutrition and development.

An Italian queen having mated an Italian drone, produces handsomer, and hence purer drones than similar and sister queens having mated black drones; this we have observed in many different apiaries. Our experience on this point is as follows: In raising Italian queens in the summer of '65, the first queen that mated with a black drone produced drones of an inferior color, and apparently less pure than those of sister queens mating with Italian drones. We were compelled to remove her from our apiary. We repeated the experiment afterwards with similar results. To prove that this queen must have mated with a black drone,

we offer, that, 1st, its mother was the only Italian queen within 20 miles, and the nearest cross-bred queens were 18 miles; 2d, black drones were in an adjoining apiary; 3d, the queen was one of five sisters reared from the aforesaid queen, all hatching on the same day, and reared from eggs laid on the same day, and their brothers (the drones) were hatched 6 days before them; 4th, 4 of the sisters, after impregnation, all produced progeny similar to their mother, and this one different. Fertile Italian workers, and unfecundated queens, have better drones than queens, reared from similar eggs, and mated with a black drone. Another marked characteristic of such cross-breeding is that the bees are more irritable and unmanageable. Continued cross-breeding with only occasional additions of strains of black blood, together with the imperfections of forced queens and drones, will rapidly reduce the standard of purity of Italians. The evidences of this degeneration are unfortunately too apparent in very many apiaries.

For the American Bee Journal.

Contrast of Differently-managed Hives.

No. 1 has ten pounds of honey to commence with in the spring. No. 2 equal, with the exception of the honey. Each stock can get enough supplies till the white clover blossoms.

June 10th. No. 1 uses the honey in the hive to raise a stock of young bees, and can swarm and make surplus honey generally before the flowers fall.

No. 2 commences June 10th, when they can get feed enough, fill their combs with brood; in twenty or thirty days, when the young bees are ready to work, the yield of honey fails, and the stock can neither swarm nor make surplus honey. Remedy: feed No. 2 one or two dollars worth of sugar, and get a swarm and surplus honey, and the old stock good for wintering.

If movable comb-hive sare used, and there are over ten pounds of honey in the hive in the spring, change combs, and benefit each stock, as the empty cells in each hive will soon be filled with brood, and the young bees be ready to work and pay the owner for the little time spent in changing combs.

JAMES M. MARVIN.

ST. CHARLES, ILLS.

For the American Bee Journal.

Honey Gathering.

The increase of honey in six artificial swarms of Italian bees, placed in hives of empty combs, June 20, 1866, with one comb of eggs and honey in each hive, was as follows, viz: the least increase in one day was 5 pounds, 14 ounces; the largest increase in one day was 7 pounds, 2 ounces. Decrease in weight during the night in each hive from 9 to 15 ounces. The amount varied but a few ounces for five days, when they became too heavy for the weights.

JAMES M. MARVIN.

ST. CHARLES, ILLS.

For the American Bee Journal and Gazette.

Great Number of Queen Cells and Queens Secured from One Hive.

On the twentieth day after the first swarm had come out, I killed the unfertile queen of an Italian stock of honey-bees on account of her being poorly marked, and introduced a brood-comb from another hive. Eight days afterwards I examined that stock, and found *forty-three perfect sealed queen-cells*. Nine of these I removed on that day, and calculated to remove some more on the 10th. On taking off the honey-board, I noticed a young queen on top of the frames, and immediately secured her. At the same time I heard another queen *teeling*, and some more *quacking*. I examined the brood-comb, and caught one more queen. Being afraid that some more queens might be at liberty, I placed the combs with all the bees on it into an empty hive, hanging the two hatched queens in cages into the swarm. I then went for a dozen queen-cages. With these on hand I took out my brood-comb, listening for *quacking* queens, and immediately heard one. With my knife I opened the cell wherein she was, and she came out. Securing her, I went on with the same game until I had fourteen queens in all.

Having no more queen-cages on hand, I went away to procure some. On returning to the comb, I found on it two queens out of their cells. These were both secured. At the same time five more issued, and I saw one of them kill another, the slain one falling to the bottom. About a minute later two more queens hatched. Seeing another conflict going on, and one slain on the ground, I took off all the five remaining on the comb, and dropped them into the grass beside the hive before I caged them. Even there a feud commenced between two of them, and I could only part them by giving them a dose of tobacco-smoke.

After securing those, I again examined the brood-comb, and found two more hatched queens, which I caged. I then removed three more queen-cells, and as it had become dark before I got through inserting them, I took the brood-comb into the house. Holding another examination there by candle-light, I secured one more queen, and only two more cells remained sealed on the comb.

After putting away the hive with the brood-comb, I hung the whole number of queens in cages into the mother hive, and found that I had secured *twenty-four* queens. The bees fed all the queens over night, and I succeeded next day in placing each one of them in a separate nucleus.

Only three of them were killed. One of the queens in a cell on the brood-comb had hatched during the night, and the brood-comb with bees and queen was returned to the parent hive.

I had killed the queen of this hive early in the forenoon, and in less than an hour the bees were in great agitation before I put in the brood-comb. At this time the bees had very

good feed on the basswood (*American Linden*) trees. This may account for the great number of queen-cells, and the early ripening of them.

A. GRIMM.

JEFFERSON, JEFF. Co., Wis., Dec. 26, 1866.

For the American Bee Journal.

The Experience of a Novice in Bee-keeping.

I have always been an enthusiastic admirer of Old Dame Nature's mysterious ways and workings.

In August, 1865, just as I had been reluctantly compelled to give up some researches into the depths of Old Mother Earth, (in shape of an oil-well, with the tools stuck fast far down in the soapstone, shale, &c.,) and was casting about for some new field of research for my leisure hours, a swarm of bees passed over near our place of work. One of the employees remembering that I had expressed a wish for a swarm of bees, jokingly asked what I would give for them, as they were circling slowly along in mid-air. Thinking it impossible for him to get them in their position, I offered him a dollar for them securely boxed. Telling me that I could have them, he started in pursuit, as he had noticed that they were rapidly nearing *terra firma*.

He shortly returned with them in an old saleratus box, and asked me where I would have my property taken. After a hasty consultation, I decided upon what I then thought would be a splendid location for them, viz: an unoccupied third-story room of our manufactory.

My first business was, of course, to begin an acquaintance with my new pets, as I had heard that they were capable of becoming domesticated to a certain extent, and was soon deeply interested in watching their departure and return, taking points from their new location, &c.

In the evening my instructor in the mysteries of bee-keeping, (the person that hived them,) raised the box, and showed the busy multitude gathered into a compact cluster in the top, (an operation, by the way, which seemed to me almost equal to facing a lion in his den,) and informed me that my swarm was not a large one, although the countless numbers seemed to me an immense multitude.

That evening the books, paper, &c., on geology and petroleum had to be laid aside for everything pertaining to bees and bee-culture.

Our book-stores contained nothing on the subject, and I had to content myself with what I could learn from the agricultural papers.

The next day I had but little time to devote to the subject, but as they seemed busily engaged about something, I supposed them all right. As I must have some way to see them at work, I was informed by a friend that all that was necessary was to put a glass jar inverted over the top of the box with a hole cut through.

The third day they were still at work, as I supposed—that is, they were doing something.

As I was going up in the middle of the day to see how they came on, congratulating myself that there must be some pounds of honey by this time, and thinking that I should have to get my glass-jar fixed up, when lo!—What means this unwonted stillness? Do bees, then, as well as other mortals, take a rest after dinner? Or have they decided to await the cool of evening before resuming labors? At any rate, where before had been the busy stir and bustle, now all was still. On raising the box, what a deserted appearance; not a bee; not a particle of comb! They were all gone, gone! as effectually and surely beyond my reach as the drill and tools at the bottom of my well fast in the rock.

In my ignorance of their habits I had placed them before a west window with the sash raised, exposing them to the full heat of the afternoon sun; and after waiting two days, they had probably concluded they could suit themselves better.

Although they were gone, the interest they had awakened still remained, and I had learned a few facts in regard to bees by experience, not known to every one at least.

First, (which by the way I shall call fact No. 1,) bees are sometimes at fault in their organ of location, as a workman at a window adjoining them soon—that is, before they left—complained grievously of the number of bees that flew in at his window and about the room, apparently lost, as there were eighteen windows nearly all alike, but still situated as much as 10 or 15 feet apart. Is it not so with hives all alike when placed near each other?

I soon procured a copy of Langstroth's work on the Honey Bee, and read it with an interest and awakened enthusiasm only known to those who have been similarly situated. I do not know that I ever perused a work that afforded me more satisfaction. At first the facts presented seemed too novel to be real, and I caught myself many times wondering that I had lived so long in a world full of bees, and had passed them by, knowing or thinking so little of their wondrous ways and habits; and I would here remark to all those interested in bees, that they will find both Langstroth's and Quinby's works on bees, aside from the instruction they impart, more interesting and amusing than any work of fiction.

The first volume of the BEE JOURNAL also, obtained some time after, was a whole library of instruction and endless amusement, as they were read and re-read several times, more especially after I had commenced Italian queen-raising. But more of this anon.

Of course, I soon had another swarm of bees, although it seemed to me for a time as if I should never think as much of any other as I did of the first.

I had first made a hive according to Mr. Langstroth's directions in his book, although I thought with my friend that it was the homeliest looking thing for a bee-hive, and a patent one, too, that had ever been seen in this vicinity; and was warned by others that the whole thing was impossible. To take a hive of live bees apart and put them back was sheer madness,

and that I had gone crazy on bees. But I thought that I could show them their error.

The new bees were brought, (in a patent moth-proof hive of course;) were carried home on a stick by hand a whole mile, as it was hot weather; were placed in an upper story over a wood-house, to be out of the way, (the Ohio Farmer had recommended an upper story;) and the next morning, before daylight, I was watching for the first bee to sally forth. But as I have gone as far as I intended, I will give my further bee-trials and success in a future article.

A. J. R.

For the American Bee Journal.

Ventilating Bees.

I see in the last number of the Journal a communication from a Kentucky correspondent about ventilating bee-hives, in which he assumes that it is impossible to smother bees. This from one who has "noticed, read, and studied bees some" is a little surprising, and if it were not for the risk of misleading the inexperienced, a reply would hardly be worth the space it would occupy in your valuable journal.

But he affects to talk seriously and says:—"if these learned apiarians will go out into the rural districts where bees are kept in hollow log gums, &c., and there talk about smothering bees to death, they will be laughed at for their ignorance."

I have no doubt of it. There is a saying that the ignorant are wise in their own conceit; and that knowledge is on a par with such old time superstitions as these—"If any one dies in your family you must hang crape on the bee-hives, or they will surely all die;" "If you would be lucky in keeping bees, you must not buy them with money, but must steal them and then go and pay for them with sheep," and many more equally as absurd notions. Yet some people that cherished these ideas have learned to their cost that bees can be smothered. With all deference to the writer's belief—"to shut up a swarm of bees in a perfectly air-tight hive, for thirty-six hours in the heat of summer, without any injury to the bees," is simply an impossibility. Long before that time expires, they will be one stinking mass without a sign of life.

I have no doubt your correspondent expresses his honest belief; but with bees kept in hollow log gums, with movable bottom-boards, and crevices stuffed with mud, as he describes, it would be a matter of difficulty to get them air-tight, if desired.

In burying bees in the ground, the cool, fresh earth so purifies the small amount of air they need when in winter quarters, that stocks, particularly small ones, can be wintered successfully in that way, although I have known several experiments of that character to result in perfect failure. That "ventilation is as essential to bees as pure air is to men," is a fixed fact.

D. C. HUNT.

NORTH TUNBRIDGE, Vt., Feb. 8, 1867.

[From the Bienenzeitung.]

Heat from Muscular Action.

It has been usual to attribute the extraordinary development of heat occasionally observed in a hive of bees to mechanical action. Sometimes it is assumed to be the result of the mutual attrition of the clustered bees; sometimes the effect of the tremulous motions or the rapid vibrations of the wings of the individual bees. Each of these has been regarded as the generator of no inconsiderable amount of heat. I have on several occasions undertaken to show the untenableness of this position; but find it so frequently restated and relied on, that I am induced to recur to it once more, in the hope of showing that it is entirely unfounded.

It is well known and freely conceded, that a great degree of heat can be generated by friction. Compression also invariably produces heat, and expansion or dilatation cold. Wood may be excited by friction till it bursts into flame; lead may be fused, and iron brought to a glow, by rapid hammering. Nay, the spark thrown off by the stricken flint is molten steel, which indicates a temperature of 1400°.

Nevertheless, bees are unable, by any mechanical process of attrition or compression, to raise the temperature of their bodies even the fraction of a single degree. For the production of heat in this manner, the development of an amount of force is required, such as insects cannot command. The heat produced by compression manifests itself only when the body with which, either as free or latent, it is combined, is brought within a more contracted space. To effect this confessedly transcends the power of the bees, and they would annihilate themselves by friction, before they could by attrition, in the slightest degree, elevate the temperature of their bodies.

But all motion, all friction, all alar vibration, involves muscular action; and possibly bees might, in this way, indirectly generate heat. We must, therefore, inquire whether the very considerable increase of temperature at times observable in hives, may not, at least in part, be the result of increased muscular action. For, since Helmholtz has shown (in Müller's Archives for 1848, page 114,) that a muscle in action always develops heat, it is regarded as an incontrovertible truth in physiology, that in the muscle, as in the steam-engine, active force is produced by combustion, and that, consequently, the oxidizable substances and the oxygen stored up in the muscle are drawn upon and consumed for the evolution of heat. Aye, and long before science became cognizant of this fact, man instinctively knew how to warm himself in a low atmospheric temperature by active bodily exercise. It was hence quite natural that scientists and intelligent bee-culturists should early conceive the notion that the increased heat occasionally manifested in the hive, was the result of peculiarly energetic muscular action. This the more so, since it was obvious that the muscular force of insects, and of bees more especially, is enormously great, and that hence great results, in all direc-

tions, were to be looked for therefrom. But when we subject to careful scrutiny the experiments and observations made in this regard, we shall soon find that we can place only an infinitesimally small portion of the increased temperature of the hive to the credit of muscular action.

Reaumur appears to be the first who directed his attention to the subject. In his "*Memoires pour servir à l'histoire des insectes*," volume 5, part 2, page 362, he says: "Bees generate heat by the active motion of their wings and legs, as we warm ourselves in cold weather by violent exercise." But Reaumur failed to furnish the proof of this assertion; and it is not easy to conceive how he could have proved it. It need not be denied that bees are able thus to raise the existing internal temperature of the hive one or two degrees. But beyond this they cannot go, as will be manifest from what will be hereinafter stated. Besides, they are able to effect this for a very brief period only, when suddenly exposed to cold, or otherwise disturbed or annoyed. The increased heat thus produced not only vanishes again as soon as the muscular action from which it arose ceases, but it diminishes already even while that action is in continued operation, as we shall presently see.

The statements of Newport, who took up the subject long after Reaumur's views were expressed, are much more precise. Still, they are utterly untrustworthy, which fact is of the more importance, since subsequent inquirers rely wholly on him, without having made any observations themselves. Newport says: "On the 2d of January, 1836, at 7.30 in the morning, with an external temperature of 17° F., the thermometer indicated 30° F. in the interior of a hive, while the bees were wholly quiescent. But when they were roused into activity by beating against the exterior of the hive, the interior temperature rose to 70° F. in sixteen minutes. The 30° of F. scale corresponds with 0.3° of that of Reaumur, and 70° F. to 17.8° R." It is hence manifest that Newport, when inserting his thermometer, did not introduce it in the cluster of the bees, but placed outside thereof in some vacant space, else he would have found not 30° F. or 0.3° R., but at least 55° F., or 10° R. Then, too, while he was pommeling the hive, and exciting the bees, these gathered and clustered around the thermometer, and thus elevated the mercury to 70° F., or 17.8° R. The increase of temperature consequent to the pommeling was therefore not 17° R. and upwards, but actually, under the most favorable supposition, (for the bees in their quiescent state undoubtedly maintained more than 10° R. of heat,) not more than 7° R. But even these 7° are not to be regarded as the effect or result of muscular action.

This is evident from the experiments made on the elevation of temperature by muscular action in the *individual insect*, as well as from the increased temperature of the *individual muscle*. Accurate experiments, touching the former point, were made about twenty years ago by Dutrochet, who first availed himself of the aid of a thermo-electric apparatus in his investigations.

By those means he found that the internal temperature of a Maybug, so confined that it could not move its legs, exceeded that of the external atmosphere by from 0.006° to 0.009° . But when its legs were liberated, the internal temperature of the struggling insect rose to 0.31° , or about 0.22° or 0.25° , in consequence of muscular exertion. This, however, was the greatest amount of increased temperature produced in the individual insect. When we compare therewith the numerous experiments made by other physiologists to generate heat in mammalia by muscular action, and which never exhibit more than an increase of from 2° to 3° R. at most, we are certainly justified in assuming that, in the hive likewise, the increase of heat resulting from muscular action cannot be greater. This elevation of temperature, as has already been remarked, can only be sustained for a short time. The degree of heat prevailing in the hive in the brooding season has hence no connection whatever with muscular action.

We infer this with the greatest probability from the skillfully-devised experiments of Dr. Heidenhain on the development of heat in a single muscle, pending increased action. After a long course of most precise investigations, by which it was first established that the heat manifested during the irritation and contraction of a muscle was not to be regarded as caused by the increased flow and circulation of the blood, but really and truly, as *generated in the muscle*, he deduces and announces the following law: "With the increasing exhaustion of the muscle, the development of heat always decreases more rapidly than the action of the muscle diminishes."

In the active muscle the development of heat proceeds only to a certain extent—small, indeed, under any circumstances, and never exceeding one degree of the thermometer; and thence sinking again *while the muscle is still in action*. Hence, if the heat decreases in the muscle during continued action, it must, of course, decrease also in the insect or animal itself.

It would transcend the limits I have prescribed to myself were I to give a full and detailed account of the interesting experiments made by Dr. Heidenhain. Those who would pursue the subject more at large can do so by referring to his treatise "*On Muscular Action*." For our purpose it suffices that, by the ascertained and announced law, the assumption that brooding heat is generated by energetic muscular action, is refuted and altogether excluded.

SCHÖNFELD.

AUGUST 10, 1866.

For the American Bee Journal.

Egyptian Bee.

Can any of the foreign writers of the BEE JOURNAL throw any light upon the comparative fertility of the queen bees of this species? Also, upon their honey-storing capacity as compared with the black and Italian varieties?

L. L. FAIRCHILD.

ROLLING PRAIRIE, WIS.

THE AMERICAN BEE JOURNAL AND GAZETTE.

WASHINGTON, MARCH, 1867.

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Italianizing.

THE safe introduction of queen-bees is a matter of such *vital* importance to bee-keepers who are procuring Italian queens for the purpose of Italianizing their apiaries, that the discovery of some sure and convenient method of accomplishing the object is everywhere regarded as highly desirable. All the modes hitherto practiced have occasionally proved inefficient, and many a "far-fetched and dear-bought" queen has become the victim of an unsuccessful effort to instal her as the head of what Berlepsch denominates "the fierce democratic" of the hive. Such losses, even when the unlucky manipulator can "afford" them, are ever an annoyance; but to one who has invested in the venture a portion of his slender means, in the fond expectation of "quick returns" and ample remuneration, failure is not only a grievous disappointment, but a serious injury and a lasting discouragement. Complaints and inquiries reaching us from every side, show that this is "an evil under the sun" very generally experienced in these days, though probably one with which Solomon was unacquainted.

We shall not undertake to prescribe an infallible method, for in our experience and experiments, while our failures have been frequent and mortifying, we have as yet met with nothing that could be regarded as a specific, though we have tested some very highly recommended *nostrums*. We believe we have read most of what has been written on the subject, by observant and reflecting bee-keepers, from the days of Schirach to the present time; and the sum and substance of the whole seems to us to be briefly this—that, to induce deprived bees to accept readily an offered queen, they must be made conscious of their destitute condition, and of their utter inability to help themselves. Anything short of this gives no assurance of success, however favorable the issue may sometimes be. It was evidently his knowledge of this fact, derived from personal observation, that enabled Knauff, one of the

most eminent and expert German apiarians, more than fifty years ago, to lay down the following as an easy practical application of the principle:

"A queenless colony will readily and under all circumstances accept a fertile queen, even though accustomed to the presence of unfertile one, *if she be offered to it in an empty hive*. In a hive containing honey-combs, bees accustomed to an unfertile queen will not accept even a fertile one, except under constraint or by compulsion. This seems obviously to be in accordance with nature, for the stores accumulated in the presence and under the auspices of the old queen, appear to serve as a constant reminder, keeping her memory fresh in the household. Even when a colony has sent out a swarm, or one has been driven or forced out, and sufficiency of queen-cells have already been started, the bees will destroy an introduced fertile queen quite as promptly as they would an unfertile one; nay, oftentimes more so. This, too, seems natural, for that is the period of change, and of an oversupply of embryo queens—an overstocking literally of the queen market. But if we drive out queenless bees, and place them in an empty hive, they will readily accept an offered queen, the more especially if she be fertile. Confine a deprived colony in an empty hive, and let it bustle and buzz as it pleases for a while, then introduce a fertile queen, unaccompanied by workers, through a hole in the top of the hive, and at the same instant open the entrance. The bees will rush out in masses, but almost immediately return and become quiet and content. All natural again, for under the circumstances the bees are conscious that they have no option in the matter; they must either accept what is within their reach, or perish miserably."

These results of Knauff's experience and observation merit special attention at this time, and bee-keepers who intend to procure Italian queens would do well to experiment previously with common queens, so as to familiarize themselves with the theory and the requisite manipulations, in case the process proves to be safe and efficient on trial. By driving out a swarm from each of two common stocks, removing the queens, and confining the bees of each swarm in an empty hive well ventilated, till they have become thoroughly aware of their queenless condition, and then interchanging the queens before introducing them as directed by Knauff, the question of safety could easily be decided, without hazarding the life of a valuable Italian queen.

WE are always glad to receive communications from practical bee-keepers. Even the briefest statement of observed facts is ever welcome. Though seemingly unimportant at the time, they may lead to highly valuable results if published. The same system of ma-

nagement is not precisely adapted to every district, and much may be gained from a knowledge of the deviations and variations which have been found advantageous in any special locality. Processes, too, may be modified or simplified; or a lucky thought may have led to the adoption of more convenient or more efficient modes of operation. Accounts of these, if communicated, can hardly fail to be of practical benefit, especially to new beginners. The freaks of bees, too, are endless and wonderful, and there is scarcely a rule laid down in the books to which we do not find exceptions in practice. All these furnish food for reflection and study, and a notice of them and of the devices to which they have led, may relieve many a novice from the embarrassment and discouragement he feels when encountering such for the first time in his own experience. Bee-culture is not all enjoyment. It has its annoyances as well as its delights. Troubles and trials and difficulties will present themselves. An account of them and of the means by which they were overcome, will serve to encourage those who are laboring under similar perplexities, and tend to infuse into them the spirit which actuates the mathematician, who takes pleasure in solving difficult problems. Of course we desire to have detailed accounts of new manipulations, successful operations, and satisfactory results in bee-culture. They will be to us as gratifying as to those who communicate. But do not omit to tell us likewise of your mishaps and failures, of plans frustrated and hopes disappointed—for you can hardly have escaped being harassed by such—and your contributions will assuredly prove to be not only acceptable to us, but interesting, instructive, and useful to a large number of inquiring bee-keepers.

THERE is little danger to be apprehended from the bees when they swarm, because at that time they are well gorged with honey, with which they take care to supply themselves richly before leaving their maternal home, as an outfit for organizing their contemplated new establishment. At such times the naked hand may be thrust up into the middle of a swarm as it hangs on a bough, without their showing the least resentment; which, were they in their hive, they would not suffer without the utmost indignation. But if they have been hovering about long after swarming, before alighting and clustering, or have been clustered on a limb an hour or more after swarming, so that much of the honey with which they had supplied themselves has been digested, they will be apt to become irritated, if not gently managed at hiving.

Impure Drones.

We copy on another page, from the "*American Agriculturist*," a communication of Messrs. Bidwell Bror's, respecting the quality of cross-bred drones, in which the opinion is expressed that all such drones are necessarily more or less impure. This opinion is based on the assumption that the semen of the drone "forms part of the system" of a fertilized queen, "requiring the blood or fluids of her body to circulate into it and back into her for its nutrition and development."

The subject is an interesting one, and has claimed the attention of apiarians and physiologists ever since the Dzierzon theory was promulgated in the *Bienenzeitung*. The more fully it has been investigated, the more decided has been the conviction that the drones are always precisely of the same character and quality as the queens producing them.

The spermatheca of an unfertilized queen is usually found charged with a pellucid liquid, deposited therein by secretory glands. It is consequently a secretion which, as such, remains there, unless discharged through the orifice of the organ into the oviduct, and voided as other secretions and excretions are. It does not return into the circulation any more than do the contents of the poison-sac, at least no vessels have yet been detected, in either case, fitted to reconvey. Moreover, the sperm is not a fetus, requiring circulation for its growth and development. It has simply vitality, and that vitality is preserved for the time by the liquid in which it is immersed, just as the simple vitality of the egg can be preserved for a protracted period by immersion after extrusion.

This is the view of the case now entertained. Until vessels are found, fitted for the reconveyance into the queen's system, of the liquid contents of her spermatheca, so as to re-introduce it into the circulation, we shall have to accept the theory as correct, however much appearances may sometimes seem to militate against it. Again, if the suggestion that cross-bred drones are necessarily impure, is to be received as a ruling principle, it ought to be found to work *conversely* also—that is, common queens fertilized by an Italian drone should produce hybrid, or at least contaminated drones. But this is conceded not to be the case. No evidence, of any such contamination, has ever yet been found, though often looked for. The proof here is more satisfactory and conclusive also, as it is much easier to obtain common queens of undoubtedly pure race to breed from

than it is to procure Italian queens wholly free from taint, since it is claimed that even the best to be found in Italy have some fragmentary admixture of black blood.

Phora Incrassata and Foulbrood.

In a notice of Dr. Asmusz's treatise on the "*Parasites of the Honey-Bee*," the Rev. Mr. Kleine says he cannot concur in opinion with the author that the *Phora incrassata* is the cause of foulbrood. "This insect," says Mr. Kleine, "is universally diffused in Europe, depositing its eggs in hives in which it finds dead bees; yet we do not find foulbrood as universally prevailing. Certainly that which is caused by the *Phora* in one section of country, should also be caused by it in another, if instinct induces it to deposit its eggs in the larvæ of the bee. Such, however, according to my observations, is not the case. The *Phora* never makes a nidus of living organisms, but instinctively selects dead bodies for that purpose. But if, as the author believes his microscopic investigations show, it does exceptionally lay its eggs in the living larvæ of the bee, it would be exceedingly strange, indeed, if the immediate total decomposition of the larvæ should be thereby induced. Nothing like that is known to take place, under similar circumstances, in the case of any other parasitic insect which selects the body of another as the nidus of its eggs. If the author's views were well founded, the pupæ of the *Phora* would be found as abundantly in foulbroody hives as they are found in such as contain dead bees to which the *Phora* has had access. Yet such is not the case. Foulbrood in fact continues to be a mystery and a puzzle, the solution of which bee-culturists are anxiously awaiting, as the discovery of its nature and cause might enable us to devise a preventive or cure. We trust that some advance in this direction will be, or has been, made by Mr. Fisher, of Vaduz, who entertains a new theory of this disease, and bases his presumed remedy thereon. We expect an exhaustive treatise from his pen on this important and perplexing subject, and trust he may succeed perfectly in unravelling it."

For the American Bee Journal.

Patent Latent?—Reply.

MR. EDITOR: I notice in a recent number of the Journal a serio-comic article headed "Patent Latent" from L. L. Langstroth. Justice to myself demands an answer or reply to his egregious conclusions. Mr. Langstroth very well knows that devices unexplained would render a "patent" "latent," and as he remarks that the object of patents is to induce inventors to make known their valuable discoveries, it was very proper that I should mark my "Circular" "patented," as it contained the elements of my patent of April 5, 1864.

Very respectfully,

W. A. FLANDERS.

[From the Bienenzeitung.]

Honey-dews and Aphides.

I make no pretensions to scientific knowledge, but profess simply to state facts as they have come under my observation, such as may present themselves before the eyes of every intelligent person, leaving the final judgment to those who have a clearer insight in matters of cause and effect, or of antecedents and sequences, than plain folks like myself have.

Since honey-dews and aphides are phenomena which commonly make their appearance almost simultaneously, it would seem that there is some intimate connection between them. Honey-dew can be produced in a small way on pot plants in our chambers and greenhouses, if exposed several hours in a window to the direct warm rays of the sun, placing them at night in a colder temperature, and repeating the process several days in succession.

Such plants, particularly monthly roses, &c., thus treated, will have their circulation excited by the solar heat, till twigs, buds, leaves, and blossoms become surcharged with vegetable juices. These juices are again suddenly checked in their flow and chilled, by removal of the plants to a colder position or into a lower temperature. A diseased condition is the result, which good Mother Nature makes an effort to remove or cure. The inspissated circulation which, like all vegetable juices, contains more or less saccharine matter, is thrown out or expelled through the pores of the leaves. If it now happen that this extruded matter is so abundant that it cannot be speedily dried up, or is not soon washed off, or carried away by nectar-loving insects, continued warmth will generate fermentation, followed by the production of myriads of aphides, or plant lice, as they are often called. These are probably designed by nature to consume and remove the clammy coating from the leaves, and thus cleanse the plant. If we remove these aphides, without washing off from the leaves the clammy saccharine matter, the following day will witness a renewed production of aphides in as countless numbers as before. Hence the cause or antecedent must be displaced before the effect or sequence can be got rid of.

In this view of the subject we may also readily understand why the honey gathered in 1860, consisting in large part of fermenting honey-dew, proved so deleterious to the bees. It was probably collected and deposited in the cells before being thoroughly fermented, and thus retained noxious qualities, producing dysentery when consumed.

As honey-dew may thus be produced on a small scale "in a private establishment," so likewise it is produced in grander proportions in the vast laboratory of nature, when favoring external circumstances concur. Thus as when cold suddenly succeeds heat dew falls, a similar effect follows in the vegetable kingdom, resulting in the phenomenon called honey-dew. Hence, at times, honey-dew and aphides may be seen on nearly every variety of plants, when temperature and condition of the atmosphere,

and the state of the vegetable juices, concur for its production. Thus honey-dews only occur if cold suddenly follows humid warmth, at a time when trees and smaller plants are turgid with the full flow and circulation of sap, and every leaf-vessel is exuberantly filled with still unchanged saccharine juices; and aphides follow in course if the subsequent state of the weather cause fermentation in these extruded juices.

J. MUELLER.

For the American Bee Journal.

To Obtain the Largest Amount of Surplus Honey.

In June, 1865, I placed a strong swarm in a large Langstroth hive, 18 inches square, and 9 inches deep, holding 13 frames. This hive was completely filled during the season, and the colony wintered well on its summer stand. June 1, 1866, I removed the honey-board, and placed six boxes directly over the frames, the boxes being made six inches deep, and large enough to precisely cover the whole top of the hive, the outer ends of the boxes resting on the sides of the hive, and the inner ends resting on a thin slat placed on the top of the middle frame, thus preserving the shallow chamber above the tops of the frames, and allowing free access to all the boxes. These six boxes were all filled with honey during the season, weighing, when taken off, 61½ lbs.

I was absent from home during the swarming season, but have reason to believe that this hive threw a large swarm. The bees had been noticed to hang out in immense numbers for several weeks, when they suddenly ceased to do so, although the weather continued as warm as before; but no one saw a swarm leave. Last year was considered a very poor honey year in this vicinity, very few colonies casting swarms or storing any surplus honey.

I attribute the success of this colony, as compared with those of my neighbors, mainly to the form and size of the hive. It contains, exclusive of the space occupied by the frames, about 2,500 cubic inches, giving full scope to the most fertile queen, and thus keeping up a strong stock. Then, its area for surplus honey-boxes is the largest possible, and the distance to be traversed by the bee to deposit its load of honey is the shortest possible. I am satisfied that, within reasonable limits, the *larger the space* given to bees for surplus honey, the *more* they will deposit, other things being equal. One great merit of the Langstroth hive is that its broad and shallow form affords abundant space for surplus boxes.

Some bee-keepers have raised objections to this form of hives, thinking that bees did not winter well in them. I believe that any failure to winter bees successfully in the Langstroth hives is due to some other cause than its form. I have used them for several years, and never lost a swarm, and would not do without them for twice the patent fee charged, for they pay it back in extra surplus honey the first season.

R. BICKFORD.

SENECA FALLS, N. Y., Feb. 11, 1867.

For the American Bee Journal and Gazette.

I began bee-culture in this country with the common box and basket-hives, in which the bees were when I procured them, using magazine hives as my stock increased; but for some years past I have used the Dzierzon standard and larger hives exclusively—more especially of late his twin hives, with which I am well pleased. In my practice I prefer bars to frames. I intend in future to use the Langstroth hive also.

From an Italian queen procured from Mr. Langstroth, I have already by division and the use of nuclei increased my stock of that race to twelve colonies. These Italian bees render bee-culture so peculiarly attractive that I shall as speedily as possible substitute Italian queens for all the common queens remaining in my apiary. For this purpose I shall resort exclusively to artificial swarming, because natural swarms usually come too late in the season.

The past year was not altogether favorable for bee-culture in this region, though I was still able to take from twenty to thirty-five pounds of honey from each of my stronger stocks.

I shall endeavor to contribute all I can to the diffusion of improved bee-culture in this neighborhood, mainly for the sake of advancing the good cause.

S. M.

CINCINNATI.

For the American Bee Journal.

Failure of Honey.

Mr. Editor: I wish to inquire of you, or through the Journal, whether the honey resources of a country become impoverished as the country grows old. When this part of the country was new, almost all the bee-trees and hives were full of honey in the fall of the year.

At that time, and before the forests were cleared, those that cut bee-trees and killed off their bees in the fall, thought nothing of taking from one hive from fifty to one hundred pounds of honey, and now it seems hardly worth while to keep bees, or take them up in the fall. It is seldom a new swarm will gather honey enough to keep it through the winter, except it is put into a hive with combs. New or first swarms last summer did not gather only from two to ten pounds of honey; and there will not be one out of ten that will see the first of April next without they are liberally fed; and old stores are very light. There is certainly something wrong. The honey has become exhausted, the seasons are not right, the honey-producing flowers have failed, or the country has become overstocked with bees. There seems to be a steady decrease of honey in single hives. There were plenty of flowers with us last summer, especially White Clover and Apple blossoms, and more buckwheat sown than for any three years previous, in this section. Am I wrong in attributing a failure to the age of the country?

THOS. PIERSON.

GHENT, OHIO, Feb., 1867.

[From the Bienenzeitung.]

Hermaphrodite Bees

One morning early last summer I found at the entrance of one of the hives in my apiary two hermaphrodite bees, still alive, though too young to be able to fly. These bees were differently formed from any heretofore described by observers, having the head and thorax of a worker, and the abdomen of a perfect drone. With every effort I was unable to discover the queen which had produced these malformed bees, nor could I find any more similar specimens.

I thence inferred that, under peculiar circumstances, even from a healthy queen, generally producing normal brood, offspring of such mixed characteristics may proceed. But how? or why? I do not undertake to say. Still it seems to me that the assumption of an insufficient infusion of spermatozoon—that is, of a quantity inadequate to effect the perfect transformation of the germ from male to female might serve as the basis of a satisfactory elucidation of the mysterious fact. Beyond this I shall not venture to go.

I may add here that I have been fully recompensed for my sedulous attention to the cultivation of the Italian bee, not only by securing a large number of purely fertilized queens, but by obtaining from my apiary, thus improved, an increased supply of honey. My persevering support and defence of this valuable variety of the honey-bee has likewise resulted in overcoming and removing the strong prepossessions against it, which the Baron of Berlepsch has for some years entertained, growing out of certain unsuccessful experiments. The Baron has at last begun to Italianize the apiary established by himself and Mr. Kalb, near Gotha.

H. A. HOFF.

To ascertain whether the expectation of a queen was sufficient to keep alive the instinct and industry of the worker bees, Reaumur placed in a glazed hive some royal cells containing both grubs and pupæ, and then introduced about a thousand or fifteen hundred workers and some drones. These workers, which had been deprived of their queen, at first destroyed some of the grubs in these cells, but they clustered around two that were covered in, as if to impart warmth to the pupæ they contained; and on the following day they began to work upon the portions of comb with which he had supplied them, in order to fix and lengthen them. For two or three days the work went on very leisurely, but afterwards their labors assumed their usual character of indefatigable industry. There is no difficulty, therefore, when a hive loses its sovereign, to supply the bees with an object that will interest them, and keep their works in progress.

For the American Bee Gazette.

Range of Bees' Flight.

The following facts may be interesting to your readers, as well as valuable to the historian:

Having learned several years since that there were no bees on "Kelley's Island" on Lake Erie, in the spring of 1866 we established an apiary of the Italians there for the purpose of producing queens which were free from any admixture with the natives; to test the advantages of liberal feeding, and ascertain how far they would go for feed. We established them on one end of the Island, and in five days they were found on the other end of the Island, *five-and-a-half* (5½) miles distant from our apiary.

As there were no Italians within twenty miles of ours, they surely went the above distance from our hives. Where there is an uninterrupted supply of flowers to call them off, we know they will fly the above distance, but it may be considered questionable whether they will fly more than three miles across water for feed. We have a case in point. "Johnson's Island" (celebrated as a depot for prisoners) is about four miles distant from our apiary, across the water; and none of our bees were seen there during the season.

This season we shall carry some of our bees from "Kelley's Island" to "Johnson's Island" in a hunting-box, and ascertain whether they can be induced to go back across the water and return for feed.

We are satisfied of the importance of the above facts, as connected with Italianizing or overstocking an apiary. We expect to report this matter at the close of the season in the Journal.

W. A. FLANDERS.

SHELBY, OHIO, Feb. 10, 1867.

For the American Bee Journal and Gazette.

Bees—Their Range of Flight.

I have seen several articles in the Journal in which the writers say bees will fly three and four or more miles in search of honey. If the common bee is referred to, I question the statements, and think it would be very difficult to find them at work over two miles from home.

I am an old bee-hunter; have hunted bees in the woods, more or less, nearly every year for twenty years, and have never found the native bee at work on flowers, or succeeded in getting it to work on honey, over two miles, very seldom more than a mile and a half, from its home.

Since keeping the Italians, I have frequently had them at work on honey three miles from home; and think their being greater honey gatherers is in part the result of their more extended range of flight.

J. H. TOWNLY.

TOMPKINS, JACKSON CO., MICH.

For the American Bee Journal and Gazette.

[From the Mount Holly (N. J.) Mirror.]

The Value of Combs.

My experience leads me to think that the mass of bee-keepers place by far too little value upon the empty combs. Their full value can only be realized by the use of movable comb-hives. In the summer of 1863 our bees in Wisconsin gathered a very limited quantity and a very poor quality of honey. The following winter was very severe, and the mortality among the bees was the greatest ever known in the State. In uniting my stocks for winter I had a large number of frames filled with empty combs. I had also a considerable addition to this number from the hives of those that perished during the winter. These were carefully preserved and made use of by giving more or less of them to artificial and natural swarms in the summer of 1864. It was surprising to see how soon a swarm would fill the breeding chamber of the hive with stores when supplied with combs, and go to work in the surplus boxes. Two swarms that came off respectively on the third and fourth days of July were each supplied with ten frames nearly filled with empty combs, some of which contained bee-bread. From each of these hives I removed two comb-frames filled with honey, and surplus boxes holding from thirty to thirty-five pounds. Both hives filled the empty comb-frames with comb, but one of them stored little honey in them. In the fall both were populous with bees, and in good condition for wintering.

Two or three days later two other equally populous swarms that came off I gave no combs. They spent so much time in comb-building that they scarcely laid in stores sufficient for their winter food.

I am aware that two or three days in the height of the honey harvest makes many pounds difference in the amount of honey stored; but this will not account for the difference, as still later swarms that I supplied with combs stored sufficient honey for winter. The season was a moderately good one. Every experiment I have tried has convinced me more and more of the utility of saving combs. Of two swarms, nearly equal—as may be—the one supplied with combs, came out a long way ahead of the one that had its own to build.

The value of good combs in movable frames for the use of the bees is many times greater than their mercantile value, reduced to wax.

Every bee-keeper should be careful to preserve all the good brood-combs for the use of his swarms. All white clean pieces should be cemented into the surplus honey-boxes. Only refuse-comb should be melted into wax.

If the movable frame of Mr. Langstroth was of no other service, its value in enabling the bee-keeper to preserve his combs for future use would be a great boon. Its general adoption in the United States might be made to save millions of pounds of honey now wasted by bees in constructing comb.

L. L. FAIRCHILD.

ROLLING PRAIRIE, Wis., Feb. 11, 1867.

Lecture on Bees.

BURLINGTON COUNTY LYCEUM.—At the regular monthly meeting on Saturday afternoon last, Prof. James E. Giffin, of Moorestown, delivered an interesting lecture upon *The Bee*—the different classes, their habits and peculiarities. He called attention to the structure of the honey-comb, showing that the cells are so formed as to hold the greatest quantity of honey with the least wax in their walls, and that the base of each cell has a firm support upon the junction of three others. The number of bees in a swarm varies from 25,000 to 50,000, including from 500 to 600 drones, whose only office appears to be the perpetuation of the species. It is still a matter of doubt how it is that the queen should lay eggs, some of which hatch into neuter or working bees, while others become drones or perhaps queens. It has been supposed by some that this was owing to their being deposited in different kinds of cells, or fed while in the larvæ state with different food. The Professor intimated his disbelief in both these theories.

Bees, he said, should be allowed to build their comb downward, which they will always do in their wild or natural state. The old comb should be removed every year, as the cells, when used a second time, are lessened in size, and a dwarfish insect is produced.

The political economy of the hive is a very interesting subject. Devotedly attached to their queen, the working-bees guard and cherish her with the greatest solicitude. A cordon of sentinels reaches from outside the hive to her throne within, to watch for the common enemy, the bee-moth, and to protect her from danger. No storm of wind or rain can drive them from their posts, and every one of the vast colony will fight for the common weal, though, while he stings the intruder, he loses his own life.

The division of labor is also full of interest. Some lay the groundwork, or rather the ceiling for the comb—others build the hexagonal cells—others again spend their lives in feeding the young bees with bee-bread, made of honey and pollen of flowers, brought by another set of laborers.

Prof. G. stated some curious facts in regard to the propagation of bees from the Italian variety, which is of a yellow color. He remarked that it is not the nature of this insect in its domesticated state to sting, unless provoked, and that, last year, he had a hive in his own house, without being incommoded or annoyed by the busy workers, who produced more honey than those out of doors.

The remarks of the speaker—of which the above is an imperfect sketch—occupied about an hour, and were attentively listened to throughout.

Upon motion, the thanks of the Lyceum were unanimously tendered to Professor Giffin for his interesting and instructive address, and he was requested to continue the subject at a future meeting, which he promised to do.

MONTHLY MANAGEMENT.

March.

If, as is frequently the case in northern districts, the weather did not permit a revision of the hives to be made in February, the earliest opportunity that occurs in this month should be used to give them a thorough examination. On the first mild day that permits the bees to fly, every straw or box-hive should be gently raised, and all the droppings and dead bees removed. The latter should be carefully examined to ascertain whether there is not a dead queen among them; and if one is found, the colony be immediately united with some other that has a queen. This can be easily done by setting it on the one to which it is to be united, and opening a communication between them through the top of the latter. The droppings found on the bottom-board should be brushed into a box, as they contain much wax, and in a large apiary the saving thus made is an object worth attention. The mass can be put in a coarse bag in boiling water, and, when melted, the wax can be pressed out by wringing, and lifted off in a solid cake when cold. The bottom-boards should be well cleaned, and, if possibly, dried before replacing them, which can be accomplished by the use and substitution of a few extra boards kept for the purpose.

The occasion should also be used to ascertain whether any of the colonies need supplies of food. When this is wanted, the best article that can be given is sugar-candy, if it can be placed directly on the combs through an opening in the top of the hive—covering the opening with a woollen cloth to confine the heat, and prevent the entrance of robbers. If the candy cannot be introduced through the top, sticks of it may be inserted among the clustered bees, by gently pushing it among them between the combs from below. The next best article for feeding is pure liquid honey somewhat diluted with water, introduced below in the hive on a shallow dish or feeding through.

This, however, must be used only in the evening and at night, removing the vessels again early in the morning, that robbing bees may not be attracted to the ruin of the colony. When liquid honey is fed, as much should be given at one dose as the bees can carry up during the night, and the feeding repeated only at intervals of two or three days, till the season enables the bees to supply themselves abroad.

This revision of stock is much more easily and effectually accomplished where bees are kept in movable comb-hives. On removing the honey-board, a single glance usually suffices to show the condition of a colony as to its health and supplies. The frames can be lifted out, and the dead bees and droppings removed, mouldy combs taken away, combs with sealed honey inserted, and the hive closed again in a brief space of time, with the gratification of knowing precisely how matters stand. And where a colony is found to be queenless, the

bees and combs may be quickly distributed among other stocks, strengthening the weaker, and converting even mishaps to benefit.

As the season advances, and the bees are enabled to fly, while yet pollen does not abound, it is advantageous to place wheat-flour or rye-meal where the bees can readily have access to it. It should be put in the cells of some old drone-comb, or in a shallow wooden box, and set in some nook not exposed to driving winds or strong currents of air. The bees can be attracted to the spot by placing there also a plate containing honey or sugar-water. These should be replenished as long as the water or flour and meal are carried away by the bees.

We would not advise new beginners to resort to stimulative feeding. It is a matter requiring great judgment to determine when to do it, and demanding special care in the doing. Without this it may prove to be an entire waste of time and honey.

As the poison of bees exhales a penetrating odor, Huber was curious to observe the effect it might have on them. Having extracted the sting of a bee with its appendages impregnated with poison, he presented it to some workers which were settled very quietly at the entrance of their mansion. Instantaneously the little party was alarmed; none, however, took flight; but two or three darted upon the poisoned instrument, and one angrily attacked the observer. When, however, the poison became coagulated, they were not in the least affected by it. A tube impregnated with the odor of poison recently ejected being presented to them, affected them in the same manner. This circumstance may sometimes occasion battles amongst them, not otherwise easy to be accounted for.

OWING to some inadvertance, the subjoined cut was inserted in our last number without the proper references. We therefore re-insert it, supplying the omissions.

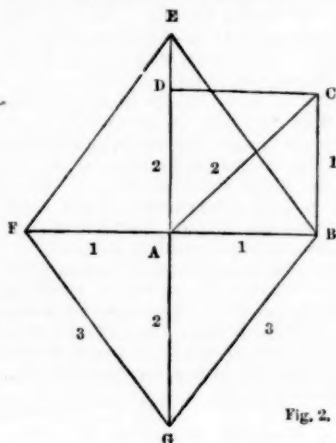


Fig. 2.